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## Abstracts of Short Communications and Posters

### Section:

## 8. Analysis

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**On Solvability of Some Nonlinear Equations in Hilbert Spaces**
In this work we considered solvability of nonlinear equations in Hilbert space $H$. Denote by $F$ mapping from $H$ into $H$.
**Theorem.** Let the following conditions be fullfiled:
1. $A$ – linear operator acting in $H$, domain $D(A)$ of $A$ is dense in $H$ and there is a constant $\alpha$ such that

$$\|(A-\lambda E)x\| \geq (\lambda-\alpha)\|x\|^2, \lambda > \alpha, x \in D(A);$$

2. $\forall x, x+h \in H : \mathrm{Re}(F(x+h)-F(x), h) \geq m\|h\|^2, m > \alpha;$
3. $\exists M > 0 \forall x, x+h \in H : \|F(x+h)-F(x)\| \leq M\|h\|.$

Then there exists unique solution $z_0 \in H$ of the equation $A(z) = F(z)$.
Further, we gave some sufficient conditions for unique solvability of equations of the form

$$Ax = Bx + \sum_{i=1}^{n} C_i^* F_i(C_1x, C_2x, \ldots, C_nx),$$

where $A, B, C_1, C_2, \ldots, C_n$ are closed linear operators with their domains dense in $H$ and $F_i : H^n \to H$.